Evolution of the Roles of the Actors in the Context of the Implementation of an "Environnement Numérique de Travail" in a University

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Abstract: The integration of Information and Communication Technologies (ICT) in teaching became a major problem in the university world. Thus, institutions of higher education are interested in tools supporting distance learning and groupware since many years. In France, the Ministry in charge of higher education developed the concept of "Environnement Numérique de Travail" (ENT) with an intention of maintaining coherence between the multiple projects.
This article has three main objectives: first evaluate the way education is transformed by the integration of an ENT, then study the way the roles of the various actors evolve in that context and finally discuss the implications of these evolutions for the integration process.
We decided to use a qualitative approach and more specifically a case study. The integration of an ENT in our university allowed us to answer the research questions.
This study highlights the evolution of the teachers' roles in the context of the implementation of an ENT. New teachers' roles are identified: educational designer, facilitator, expert and technician. We finally study the impact of these roles' evolutions on the integration process and propose some hints to facilitate this integration.

Keywords: e-learning, Information and Communication Technologies in education, change management, Environnement Numérique de Travail (ENT), distance learning, actors.

1. Introduction

Information and Communication Technologies take an increasing importance in our current world. The educational community has to adapt to these new conditions and to promote the use of tools favouring distance education (Puimatto, 2004).
The French Ministry in charge of higher education launched in 2000 calls of proposal for the creation of "Campus Numériques". A "Campus Numérique" is then defined as a "device of training centred on learning proposing innovative services via digital technologies." Afterward, accompanying policies were organized, proposing technological and uses studies, actions of training for staff, actions of information and of diffusion of the digital resources (Billouard, 2008). The initial concept of "Campus Numérique" evolved to the concept of "Environnement Numérique de Travail" in 2004. The numerical workspace is not limited to the administrative tasks any more but covers a more pedagogical role.
First we are going to present you what an ENT is and present the ENT of our university as an illustration. We will then identify the different actors concerned. In a second time, we will focus our attention on the roles these different actors could take on and particularly the way these roles evolve following the implementation of an ENT. Finally, we will discuss the issues linked to the change of the teachers' roles in France and evaluate the implications for the integration process.

2. The context

2.1 What is an "Environnement Numérique de Travail"?

French universities currently know a period of change. Several reasons are the cause. First of all, the qualification level required by companies is higher and higher and must permanently evolve in order to be in adequacy with the concept of "life-long learning". Moreover, institutions of higher education are more and more in competition with each other, in particular with the new French law on universities' autonomy, the necessity of carrying out a competitive research, the integration of ICT, the evolutions in education and the European unification (Bologna process).
To face these challenges, French universities has to carry out an effective management, to propose quality trainings, accessible to the greatest number and competitive compared to the offers from the other institutions.

This context leads higher education institutions to adopt tools favouring distance education and collaborative work. The French Ministry of higher education developed the concept of "Environnement

Numérique de Travail" (ENT) to guarantee coherence between local developments. This concept is described in an official document called "Schéma Directeur des Espaces Numériques de Travail (SDET)" (Ministère de la Jeunesse, de l'Education Nationale, et de la Recherche, 2003). Following this document, we consider that an ENT "indicates a global device supplying a user a point of access through networks to all the resources and the digital services in touch with its activity. It is the point of entrance to reach the information system of the institution."
An ENT can be considered as a common site providing tools, services and resources. The access to this site depends on an authentication. The main interest of the ENT is to connect these elements and to provide them to users in a coherent way, whatever their geographical situation is. The only constraint is to have an Internet access.

2.2 The ENT of our university and the actors identified

Our university is a multidisciplinary institution, receiving more than 22.000 students in six departments. The topics studied are as varied as: law, management, languages, literature and philosophy. Many degrees can be prepared abroad, requiring new ways of communication.

The creation of our ENT started in 2005 with the improvement of the website of the university. A new graphic charter was adopted and many Intranets were created. At the same time, the whole campus was equipped with Wi-Fi to facilitate the connections of the users.
In a preceding work (Billouard, 2008) we identified four main categories of actors attending the ENT: the students, the teachers, the administrative staff and the technical staff. To respect the concept of the ENT, each user should reach a personal workspace providing communication resources and a set of tools aiming at facilitating its work. The user should also reach a set of other resources including: educational, schooling, documentary, school life and relations with companies' services. The extent of the tools available would depend on the profile of the user concerned.

Once these actors identified, the next step of the development of our ENT was the design of targeted Intranets. In October 2006, an Intranet intended for the students was launched. Within 2007 two other Intranets were set up: one intended for the administrative staff and the other for the teachers.
From the homepage, each category of user can reach its diary which includes the events of the university. Various tools could be reached from this page: a virtual desk which provides a storage space, an e-mail and a collaborative space; documentary resources (dictionary, on-line encyclopaedia); and many other services depending on the profile of the user (for example, students can reach a schooling portal which give them administrative information).

The adopted approach relies on the implication of the various actors concerned from the first phases of development. This implication enables to create an environment that fits to the wishes of the future users, to favour the use of the tools and to make the new tool known by the different groups of users.
To facilitate the integration of the ENT, our university set up in 2006 a department called SeTIC (Service des Technologies de l'Information et de la Communication) devoted to the expansion of the Information and Communication Technologies (ICT) in the institution.
The integration of the ENT was carried out by stages, each stage corresponding to a part of the ENT. After the creation of the Intranets, a main challenge was the addition of a Course Management System. At first, information was transmitted to the actors (students, teachers, administrative staff and technical staff). This step allowed them to familiarize with the project and understand the concept of "Environnement Numérique de Travail". The SeTIC carried out a study to look for the most adapted Course Management Systems and selected three of them (Moodle, Claroline and Spiral). Afterwards, some future users were asked to test these three systems. The objectives of these sessions were to help the SeTIC choosing the tool to integrate and inform the future users about its functionalities. The Course Management System *Spiral* was selected owing to its user-friendly interface, its easiness and its extended functionalities.

Since September 2007, teachers can use the platform in their courses giving us a huge field of study.

3. The study

The purpose of this study was to determine the way the actors' roles evolve with the integration of an ENT in a higher education institution. The primary research questions were as follows:

1) How is the education process modified by the integration of an ENT?

Teacher Knowledge Students
Teacher information Students
Information

2) How do the roles of the actors' implied evolve in that context?
3) What are the issues linked to these evolutions and what is their impact on the integration process?

This study is an explanatory case study. This type of research method is well-adapted to the study of human factors. We decided to focus on the implementation of the ENT of our university, mainly for the possibility of being in the heart of the integration process.
We decided to concentrate on teachers and students because of their central role in the education process.
During the early stages of the implementation, an observatory work was carried out, supplemented by interviews of the implied people and reading of internal documents produced.
Afterwards, we attended several meetings preparing the introduction of the ENT. For example, testing sessions were organised before choosing the Course Management System. These allowed many teachers to test three different tools: Moodle, Claroline and Spiral. Another example are the training sessions organised for the teachers and the students.
During these meetings, we did an observatory work. This was particularly interesting for the teachers which were eager to express their enthusiasm, their claims or their fears about this new pedagogical tool. We also spoke to them at the end of the meetings, having interesting informal conversations.
Some teachers are willing to use new technologies in their teaching. They started to use the Course Management System at the very beginning. They were invited to present their experiences to their colleagues many times last year. We attended these presentations and this helped us to clarify the way their activities were modified.
At last, we confronted our observations and conclusions to the literature.

3.1 An evolution in the education process

The first conclusion of our study is that the use of new technologies in teaching modifies greatly the education process. Several authors have studied this phenomenon after the integration of ICT in education. These studies were carried out at different level of teaching and in different countries.

In traditional education, the information belongs to the teacher who transmits it to the learners. Assignments are aimed at checking that the knowledge is assimilated by the learners. A typical example of that kind of education is lectures. A teacher lectures to hundreds of students at the same time. This leaves little time for communication.

We can represent that in this figure:

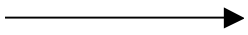

Figure 1: Traditional education

Modern pedagogy is based on a more dynamic process. In that case, knowledge is available for the teacher but also for the students. Teachers and students communicate “about” the knowledge as well as students with one another as shown in this figure:

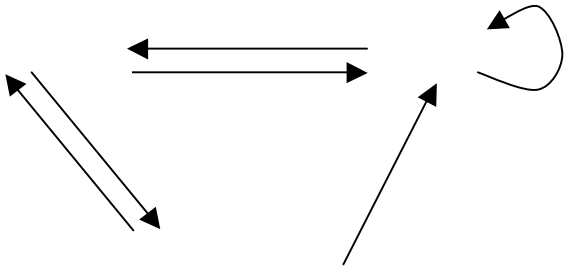

Figure 2: Modern pedagogy

Teacher Students

The use of ICT in education and particularly the use of tools like ENT should be a support for that kind of pedagogy: teachers and students have an access to knowledge (mainly by the use of databases) and they can communicate by the use of communication tools (e-mail, forums, and chat).

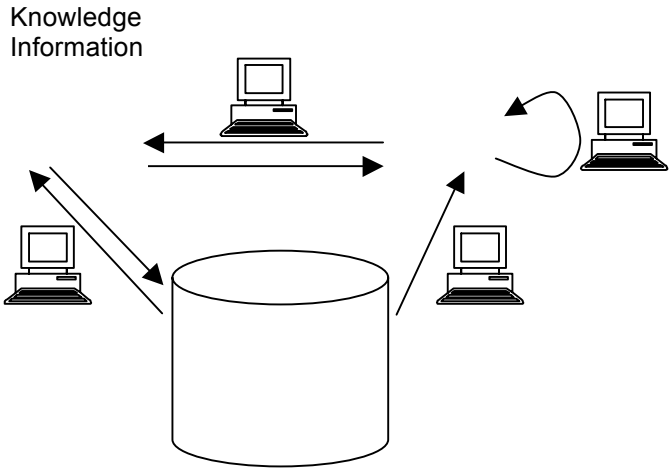

Figure 3: Use of ICT in education

Sherry considers that "changing tools is bound to change the roles of the members of a learning community" (Sherry, 1998). With the development of distance courses, it appears that traditional lectures are no longer the standard. Distance learning promotes collaboration, cooperation and idea shares (Collins and Berge, 1995). This observation leads to an evolution of the roles of the different actors implied in the process, and particularly for the students and the teachers. Distance learning is focused on collective learning and collaboration (Chan, 2003).

The use of ICT in education modifies the learner's role. Students will have to be more active in the learning process. On the other side, teachers will gradually become facilitators, learning guides and not only knowledge experts. However it's important to insist on the fact that this evolution is due mainly to an evolution of pedagogy and not only to an evolution of technologies (Denef, 2001).

3.2 Evolution of the actors' roles

As we said earlier, the teacher's role is highly affected by the introduction of Information and Communication Technologies. Traditionally, teachers were considered mainly as being experts in their field. Their role was to transmit their knowledge to the students.
In a distance learning context, many roles can be assumed by the teacher. According to the literature, several new roles can be identified. We decided to gather these roles in the main following competencies:

- Educational designer: design, maintain, integrate and keep on-date courses content, e-learning activities and assignments.
- Facilitator: this role is quite new for teachers and is crucial in an online environment. Teachers would have to guide the students in their online training. This role implies making the students participate and work in cooperation (Sauvé, 2004). They would also have to communicate a safe and trusty feeling about the environment.
- Expert: in online courses, teachers still have to be experts in their field and to be capable of transmitting their knowledge in a technologically advanced context.
- Technicians: to teach online, it is necessary to understand the functioning of the tools. In a collaborative environment, teachers should also have to help students in the use of the technology and transmit them capabilities to work in project groups (Seok, 2007).

In distance learning, the learner also has to evolve and become an independent and active searcher of information. The autonomy of the learner results from the less directive role of the teacher. Learners are more responsible for their learning.
The role's evolution of the students will depend of the pedagogy adopted by the teacher, the roles he plays and other students' behaviours participating in the course.

Personal perception

Promotion and recognition

Teachers' related issues

Students collaborate with each others and with the teacher. Communication is important in distance education to avoid isolation feelings of the participants.

Copyright issues

Teacher's training

The next section of this article will discuss the issues linked to the evolution of the teachers' roles and the impact it involves for the university. At last, we will deduce some consequences for the integration of an ENT.

4. Discussion

4.1 Teachers' related issues

In this section we will identify the issues linked to the teachers' position in a context of the implementation of an ENT.

The first concern deals with the personal perception of the teacher. Some teachers are strongly opposed to the use of ICT in education. Just the opposite other teachers are precursors in the use of ICT. They developed high competencies to integrate new technologies in their courses. They became authors (design and development of courses), project managers, experts but also prescribers in technology matters (Granget, 2004). These teachers often started using technologies well before the official incitation. In our university, some teachers created personal websites for their students a long time ago. They used them to communicate with their students between face-to-face sessions.
But the majority of teachers are among those two extreme cases. The challenge will be to convince them to adopt the ENT and the Course Management System. The first step would be to make them feel less anxious about new technologies. It's generally admitted that specific trainings and development of computer literacy permit to better harness technological tools and to generate more positive attitude towards ICT (Carugati, 2002).

The ICT development faces diverse and arduous issues: teachers' training, promotion and recognition of new tasks and copyright issues. In France another issue comes from the particular status of teachers in higher education.

In France, universities are public organizations regulated by official decrees. This implies that changes are drawn-out.
The decree of 6th June 1984 describes the duties of teachers. The third clause of the decree precise teaching duties (elaborate and transmit knowledge in initial and continuous education) and research duties (develop basic, applied, pedagogical or technological research and give value to the results) (French decree, 1984).
This legal frame makes tough the recognition of non face-to-face teaching activities. The decree allows teachers to practice extra activities and receive an adding remuneration for these tasks. But in reality the use of this option remains exceptional and teaching hours by distance education aren't incorporated in the basic duty of teachers. Furthermore, teachers' careers evolve mainly on research quality criteria (Granget, 2004).

The following figure resumes this section:

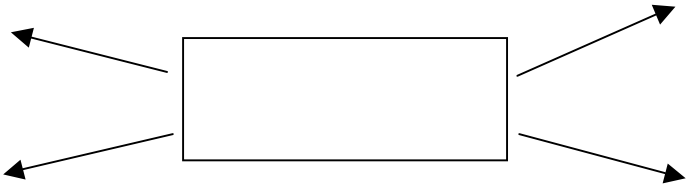

Figure 4: Teachers' related issues

To conclude, using ICT makes the work richer for the teacher because it's diversified with upstream (design of courses) and downstream (educational follow-up and assistance) tasks. The counterparts are a lack of time and an accumulation of tasks and responsibilities.

4.2 Implications for the integration process

Our study allowed us to deduce several consequences for the integration process. The issues linked to teachers' roles identified in the precedent section make us define some hints for the success and the increase of the adoption rate of an ENT. Among these factors, the first refers to the characteristics of the ENT. Others are more due to social, organisational and psychological reasons.

Liability of the ENT is a key factor in the success of integration. Problems that should arise are varied: software's incompatibility between teacher's home and university, difficulty to obtain assistance, tools' malfunctioning, bad quality of Internet access or even out-of-date software.
To guarantee the liability of the ENT, we advise to buy hardware and software on qualitative criteria and not economical ones, to keep software up-to-date and to train and motivate technical staff so they would react quickly and efficiently in case of breakdowns.
Technical support is a motivation factor for the teachers interested in online teaching. Assistance for the design of courses could also be a factor of success.

Another important factor is to give the users means to learn how to use the new tools. They may encounter difficulties knowing where to find the trainings and which training corresponds to their needs. Their timetables should be adapted so they could assist the training sessions.
Training should be optimised by having the new technologies tested by teachers having diverse levels and by the elaboration of training programs.

An important obstacle to the adoption of an ENT is the fact that teachers should have doubts about the utility of this tool for training. Some teachers may think that technology is not an improvement for education, especially against the personal effort it implies.

An important key factor which appeared in the context of the ENT of our university is the institutional support. This point is crucial for the different actors to become conscious of the importance of this tool in their daily life. Acknowledgment and incentives at an organisational level are essentials. When teachers perceive an institutional support, their motivation and implication are higher.
Another issue relates to the working load. Teachers feel that the time dedicated to the development of an online course could be devoted to research activities. Furthermore time devoted to online teaching is less valued than time dedicated to research or even face-to-face teaching. The lack of reward by financial remuneration or tenure is a major barrier for the teachers' implication (Maguire, 2005).

5. Conclusion

After a description of the concept of "Environnement Numérique de Travail" we identified the different actors implied in the daily use of that environment: students, teachers, administrative staff and technical staff. The project of implementation of the ENT of our university associated with the literature enabled us to identify the evolution in pedagogy induced and the mutation of the roles of teachers and learners.
The rest of the article was devoted to teachers. We described the particular context of French universities which makes it difficult for teachers to invest time in distance education. Some related issues were cited: need to incite teachers to get involved in distance education, trainings necessity, tasks' recognition difficulties and copyright issues.
We finally identified some keys factors affecting the implementation of an ENT.
Motivating teachers is an essential need for each distance education initiative. This led us to imply the actors at the early stages of our project of implementation.
The Course Management System of our ENT is still at its beginnings. We plan to realise a quantitative study to confirm the findings presented in this article.

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